CHAPTER 29

PRICE AND OUTPUT DETERMINATION: OLIGOPOLY

In many of the manufacturing, mining, wholesaling, and retailing industries of American capitalism a few firms are dominant. Such industries are called *oligopolies*. It is with such industries that the present chapter is concerned. Specifically, we have four objectives. We seek first to define oligopoly, assess its occurrence, and note the reasons for its existence. The second and major goal is to survey the possible courses of price-output behavior which oligopolistic industries might follow. Third, the role of nonprice competition, that is, competition on the basis of product development and advertising, in oligopolistic industries is discussed. Finally, some comments with respect to the economic efficiency and social desirability of oligopoly are offered.

CONCEPT AND OCCURRENCE OF OLIGOPOLY

What are the basic characteristics of oligopoly? How frequently is it encountered in American capitalism? Why has this industry structure developed?

The outstanding feature of oligopoly is "fewness." When a relatively small number of firms dominates the market for a good or service, the industry is oligopolistic. But what specifically is meant by "a few" firms? This is necessarily vague, because the market model of oligopoly covers a great deal of ground, ranging from pure monopoly, on the one hand, to monopolistic competition, on the other. Thus oligopoly encompasses the tin-can industry, in which two firms virtually dominate an entire national market, and the situation in which, say, fifteen or twenty gasoline stations may enjoy roughly equal shares of the petroleum products market in a medium-sized town. Table 29–1 lists a number of industries in which fewness is present in varying degrees. This table correctly suggests that the market structure of oligopoly is very common in American capitalism. And we remember from Chapter 28 that many aspects of the retail trades are characterized by oligopoly.

Rivalry between a small number of firms interjects a new and complicating factor into our discussion: *mutual interdependence*. Imagine three firms, A, B, and C, each of which has about one-third of the market for a particular product. If A cuts price, its share of the market will increase. But B and C will be directly, immediately, and adversely affected by A's price cutting. Hence, we can expect some *reaction* on the part of B and C to A's behavior: B and C may match A's price cut or even undercut A, thereby precipitating a price war. This correctly suggests that no firm in an oligopolistic industry will dare to alter its price policies without attempting to calculate the most likely reactions of its rivals. To be sure, cost and demand data are important to the oligopolist in establishing price, but to these we must add the reaction of rivals, a highly uncertain factor. The situation faced by oligopolistic producers resembles that of participants in games of strategy such as poker, bridge, or chess. There is no way of knowing beforehand the best way of playing your cards,

because this depends upon the way in which other participants play theirs! Each player must pattern his actions according to the actions and expected reactions of his rivals. In recent years economists have sought to develop and apply a "theory of games" to the behavior of oligopolies.[1]

It is to be emphasized that the mutual interdependence resulting from fewness, and the consequent need for a firm to weigh the possible reactions of rivals in altering its price policy, are unique features of oligopoly. The large number of rivals which characterizes pure competition and monopolistic competition and the absence of rivals which is the earmark of pure monopoly rule out mutual interdependence in these market structures. Indeed, a good, workable definition of oligopoly is this: Oligopoly exists when the number of firms in an industry is so small that each must consider the reactions of rivals in formulating its price policy.

The existence of a small number of firms correctly suggests that barriers to entry characterize oligopolistic industries. In some oligopolistic industries—for example, automobiles, agricultural machinery, and steel—technological considerations as reflected in economies of large-scale production constitute the basic barrier to entry. Many industries start out with a large number of firms, but then as technology improves, each firm attempts to expand in order to achieve the lower costs which economies of scale provide. For example, estimates suggest that as many as 70 to 80 firms populated the automobile industry in its infancy. Then the introduction of mass-production techniques reduced the field through failure and combination. Now the Big Three of the automobile industry have over 90 per cent of the market. The existence of other oligopolies, for example, the electronics, chemical, and aluminum industries, is grounded basically upon the ownership of patents or the control of strategic raw materials. Less frequently the advantages of being established as reflected particularly in prodigious advertising outlays may present a significant financial obstacle to entry. The cigarette industry is the classic illustration.

Finally, oligopolies may produce either standardized or differentiated products. Many industrial products—steel, zinc, copper, aluminum, lead, cement, industrial alcohol, and so forth—are virtually standardized products in the physical sense and are

TABLE 29–1. PERCENTAGE OF OUTPUT* PRODUCED BY FIRMS IN SELECTED HIGH-CONCENTRATION MANUFACTURING INDUSTRIES, 1958

Industry	Per cent of industry output produced by first four firms
Primary aluminum	100
Passenger cars	99
Linoleum	96
Locomotives and parts	95
Electric lamps (bulbs)	92
Telephone and telegraph equipment	92
Gypsum products	88
Steam engines and turbines	87
Sewing machines	81
Tin cans and tinware	80
Cigarettes	79
Typewriters	79
Synthetic fibers	78
Phonograph records	76
Tires and inner tubes	74
Tractors	69
Distilled liquor	60

* As measured by value of shipments.
Source: Senate Subcommittee on Antitrust and Monopoly, *Concentration Ratios in Manufacturing Industry, 1958* (Washington, D.C., 1962), part I, table 2. Aluminum and sewing machine data are for 1954.

[1] The interested reader should consult two informative and delightful books on the subject: John D. Williams, *The Compleat Strategyst* (New York: McGraw-Hill Book Company, 1954), and John McDonald, *Strategy in Poker, Business and War* (New York: W. W. Norton & Company, Inc., 1950).

produced under oligopolistic conditions. Of course, even here slight physical differences may exist, and the service, credit, and speed of delivery may differ between sellers, making for a measure of differentiation. But for most practical purposes these are standardized products. On the other hand, many consumer goods industries—automobiles, tires, typewriters, petroleum products, soap, cigarettes, fountain pens, and a host of electrical appliances—are differentiated oligopolies.

PRICE DETERMINATION

Now at first glance one might suspect that price-output determination similar to that of a pure monopoly would be possible for an oligopolistic firm. The only notable difference might be that the oligopolist's sales curve would be somewhat more elastic, because he is plagued by a few close substitute goods, whereas the pure monopolist faces no good substitutes at all. Marginal-cost and marginal-revenue comparisons would then determine the profit-maximizing output and the unique price at which this output could be sold. Unfortunately, this is too simple a picture of the situation. Indeed, more and more economists are reluctantly coming to the conclusion that formal economic theory simply does not take us very far in explaining the price-output policies of oligopolies.

There are two major reasons why it is difficult to use formal economic analysis in explaining the price behavior of oligopolies.

1. The previously noted fact that oligopoly encompasses many specific market situations works against the development of a single, generalized explanation or model of how an oligopoly determines price and output. Pure competition, monopolistic competition, and pure monopoly all refer to rather clear-cut market arrangements; oligopoly does not. It includes the situation in which two or three firms dominate an entire market as well as the market in which twelve or fifteen firms compete. It includes both product differentiation and standardization. It encompasses the situations in which firms are acting in collusion and in which they are not. It embodies the situations in which barriers to entry are very strong and in which they are not quite so strong. In short, the many breeds, or strains, of oligopoly work against the development of any simple market model which provides a general explanation of oligopolistic behavior.

2. The element of mutual interdependence which fewness adds to the analysis is a most significant complication. To be specific, the inability of a firm to predict with certainty the reactions of its rivals makes it virtually impossible to estimate the demand and marginal-revenue data faced by an oligopolist. And without such data firms cannot determine their profit-maximizing price and output even in theory, as we shall presently make clear.

Despite these analytical difficulties, two interrelated characteristics of oligopolistic pricing stand out. On the one hand, oligopolistic prices tend to be inflexible, or "sticky." Prices change less frequently in oligopoly than they do under pure competition, monopolistic competition, and, in some instances, pure monopoly. Figure 11–4 provides some interesting data on this point. On the other hand, when oligopolistic prices do change, firms are likely to change their prices together. There is a decided absence of price competition in most oligopolistic industries. However, when price competition does occasionally break out, it is likely to take the form of aggressive price warring.

Let us now explore several oligopolistic pricing policies to help explain these introductory comments.

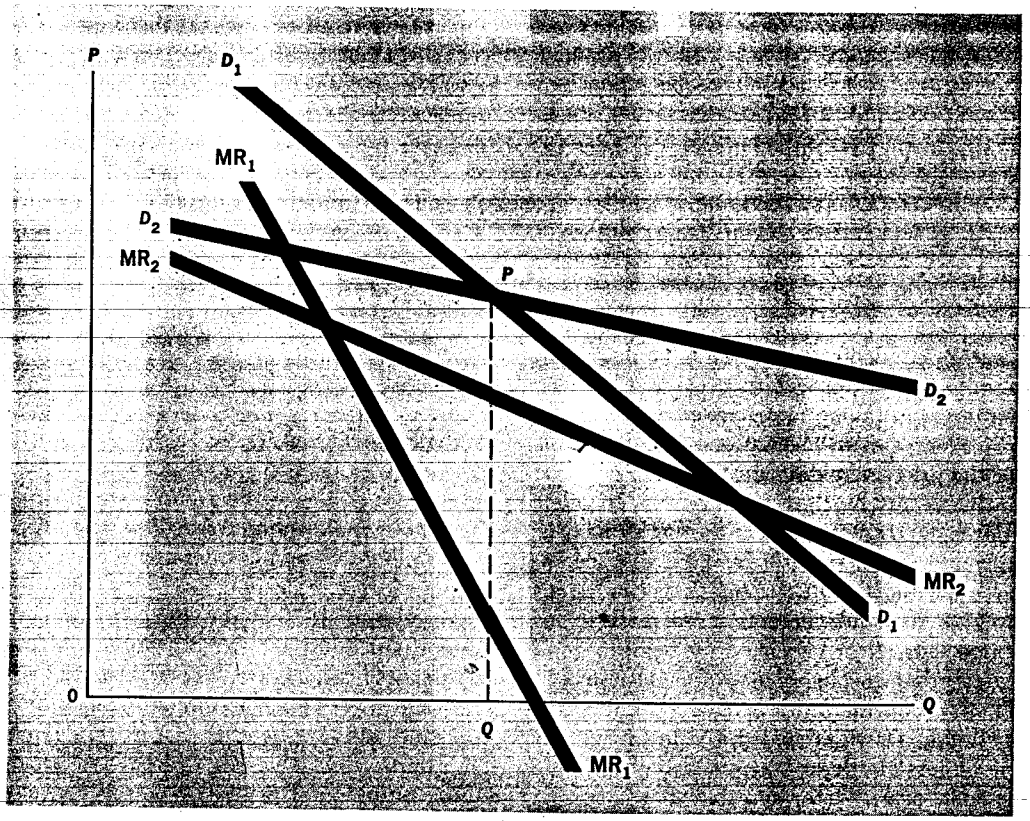
"Independent Action" and Price Inflexibility

Again suppose an oligopolistic industry comprised of just three firms, A, B, and C, each having about one-third of the total market for a differentiated product. Assume the firms are "independent" in the sense that they do not engage in collusive practices in

setting prices. Suppose, too, that the going price for firm A's product is QP and its current sales are Q, as shown in Figure 29–1. Now the question is "What does the firm's demand, or sales, curve look like?" We have just noted that mutual interdependence and the uncertainty of rivals' reactions which it entails make this question difficult to answer. The location and shape of an oligopolist's demand curve depends upon how the firm's rivals will react to a price change introduced by A. There are two plausible assumptions about the reactions of A's rivals with which we might experiment.

One possibility is that firms B and C will exactly match any price change initiated by A. In this case A's demand and marginal-revenue curves will look something like D_1D_1 and MR_1MR_1 in Figure 29–1. If A cuts price, its sales will increase very modestly, because its two rivals will follow suit and thereby prevent A from gaining any price advantage over them. The small increase in sales which A (and its two rivals) will realize

FIGURE 29–1. THE KINKED DEMAND CURVE.
The nature of an oligopolist's demand and marginal-revenue curves will depend upon whether his rivals will match (D_1D_1 and MR_1MR_1) or ignore (D_2D_2 and MR_2MR_2) any price changes which he may initiate from the current price QP. In all likelihood an oligopolist's rivals will ignore a price increase but follow a price cut. This causes the oligopolist's demand curve to be kinked (as D_2PD_1) and his marginal revenue curve to have a vertical break, or gap (as rust MR_2MR_1).



is at the expense of other industries; A will gain no sales from B and C. If A raises the going price, its sales will fall only modestly. Why? Because B and C match its price increase, so A does not price itself out of the market. The industry now loses some sales to other industries, but A loses no customers to B and C.

The other obvious possibility is that firms B and C will simply ignore any price change invoked by A. In this case the demand and marginal-revenue curves faced by A will resemble D_2D_2 and MR_2MR_2 in Figure 29–1. The demand curve in this case is considerably more elastic than under the assumption that B and C will match A's price changes. The reasons are clear. If A lowers its price and its rivals do not, A will gain sales sharply at the expense of its two rivals because it will obviously be underselling them. Conversely, if A raises price and its rivals do not, A will be pricing itself out of the market and will lose many customers to B and C, which are now underselling it. Because of product differentiation, however, A's sales do not fall to zero when it raises price; some of A's customers will pay the higher price because they have strong preferences for A's product.

Now, which is the most logical assumption for A to make as to how its rivals will react to any price change it might initiate? The answer is "some of each"! Common sense and observation of oligopolistic industries suggest that price declines will be matched as a firm's competitors act to prevent the price cutter from taking their customers, but that price increases will be ignored, because rivals of the price-increasing firm stand to gain the business lost by the price booster. In other words, the D_2P segment of the "rivals ignore" demand curve seems relevant for price increases, and the PD_1 segment of the "rivals follow" demand curve is more realistic for price cuts. It is logical, or at least a good guess, that an oligopolist's demand curve is "kinked" on the order of D_2PD_1. The curve is highly elastic above the going price but much less elastic or even inelastic below the current price. Note, too, that if it is correct to suppose that rivals will follow a price cut but ignore an increase, the marginal-revenue curve of the oligopolist will also have an odd shape. It, too, will be made up of two segments—a part of the marginal-revenue curve appropriate to D_1D_1 and a chunk of the marginal-revenue curve appropriate to D_2D_2. Because of the sharp differences in elasticity of demand above and below the going price, there occurs a gap, or what we can treat as a vertical segment, in the marginal-revenue curve. In Figure 29–1 the marginal-revenue curve is shown by the two rust lines connected by the dotted vertical segment, or gap.

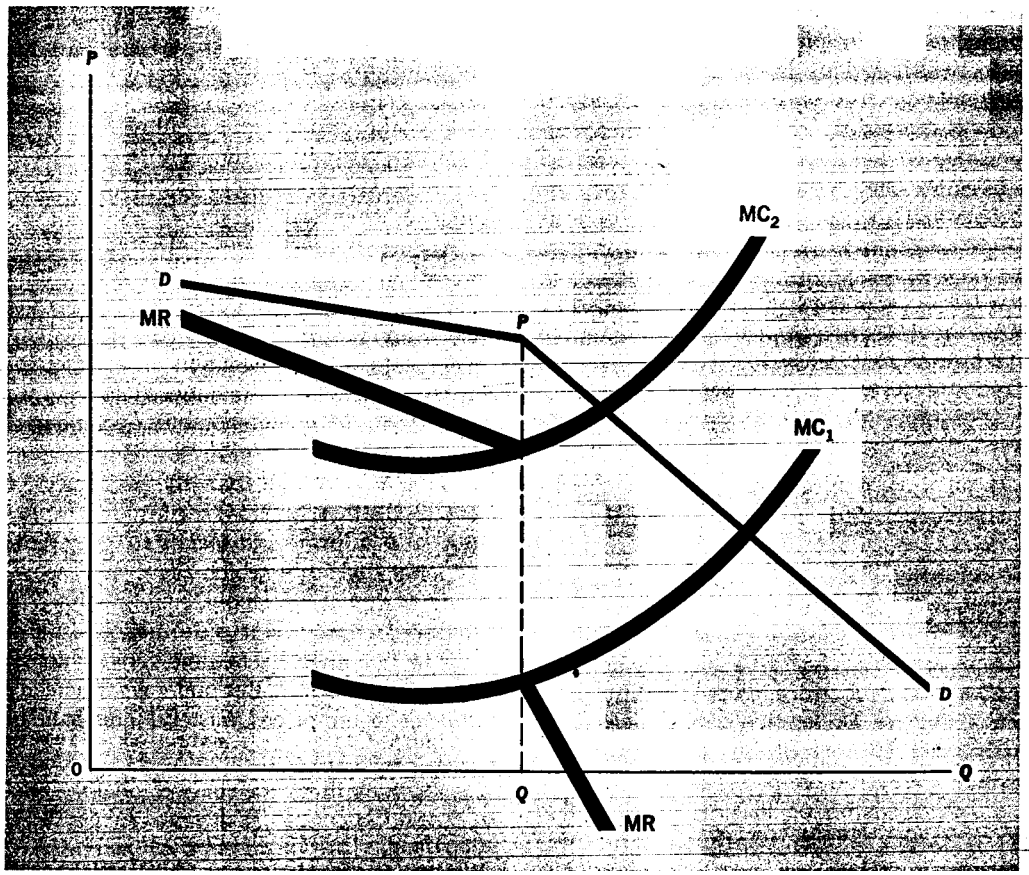
This analysis is important in that it goes far to explain why price changes are infrequent in noncollusive oligopolistic industries. On the one hand, the kinked demand schedule gives each oligopolist good reason to believe that any change in price will be for the worse. A firm's customers will desert it in quantity if it raises price. If it lowers price, its sales at best will increase very modestly. Even if a price cut increases its total revenue somewhat, the oligopolist's costs may well increase by a more than offsetting amount. Should the PD_1 segment of its sales schedule be inelastic in that E_d is less than 1, the firm's profits will surely fall. A price decrease will lower the firm's total receipts, and the production of a somewhat larger output will increase total costs. Worse yet, a price cut by A may be *more than* met by B and C. That is, A's initial price cut may precipitate a price war; so the amount sold by A may actually decline as its rival firms charge still lower prices. These are all good reasons on the demand side of the picture why noncollusive oligopolies might seek "the quiet life" and follow live-and-let-live and don't-upset-the-applecart price policies.

A second reason for price inflexibility under noncollusive oligopoly works from the cost side of the picture. The broken marginal revenue curve which accompanies the kinked demand curve suggests that within limits substantial cost changes will have no effect upon output and price. To be specific, any

shift in marginal cost between MC_1 and MC_2 as shown in Figure 29–2 will result in no change in price or output, because the oligopolist fears a price war, on the one hand, and pricing himself out of the market, on the other.

All this is not to say that the prices of noncollusive oligopolists are completely inflexible, but rather that they are likely to change only when significant and mutually applicable cost changes occur. For example, price adjustments may await wage, tax, or interest-rate increases which collective bargaining or government imposes uniformly upon the firms. Knowing its rivals are also afflicted with these cost increases, each firm boosts price with considerable certainty that each and every rival will follow suit. The practice of linking price increases to wage or tax hikes has the further advantage of shielding oligopolies from public criticism. To many the price increase—even if in excess

FIGURE 29–2. COST CHANGES AND PRICE STABILITY UNDER OLIGOPOLY. The kinked demand curve *DPD* and the accompanying broken marginal revenue curve MRMR help explain the price inflexibility which characterizes oligopoly. Because any shift in marginal costs between MC_1 and MC_2 will cut the vertical (dotted) segment of the marginal revenue curve, no change in either price *QP* or output *Q* will occur.



of cost increases—will clearly seem the fault of irresponsible unions and the insatiable appetite of government for tax revenues.

The astute reader will undoubtedly have detected a crucial shortcoming of our kinked demand analysis: It simply does not explain how the going price gets to be at PQ in the first place. Rather it merely helps to explain why oligopolists may be reluctant to deviate from any existing price which yields them a "satisfactory" or "reasonable" profit. The kinked demand curve explains price inflexibility but not price itself.

The kinked demand situation described above may be decidedly unappealing to oligopolists. It is surrounded by an air of uncertainty. Although there may be a strong disposition toward price stability, the possibility always does exist that a firm may shade its price to expand its share of the market and thereby precipitate disastrous rounds of price cutting. This is particularly likely if firms have excess capacity because of, say, a general business recession; under these circumstances a firm can lower unit costs by increasing its market share. Then, too, the possibility is always present that new firms may surmount barriers to entry and initiate aggressive price cutting to gain a foothold in the market. In addition, the tendency toward rigid prices may adversely affect profits if general inflationary pressures increase costs. All this is conducive to the establishment of some sort of collusive action by oligopolists as a means of avoiding disastrous price warring, on the one hand, and of achieving orderly price increases, on the other.

Formal Collusion

There are many forms of collusion. At one extreme a number of oligopolistic firms may form a *cartel*. Under this arrangement firms may enter into a formal written agreement which fixes product price and divides the market, the latter possibly on a geographic basis. In the United States such an arrangement is clearly at odds with our antitrust laws and, hence, a most rare occurrence.

Somewhat less formal *gentlemen's agreements* undoubtedly enjoy greater currency in American capitalism. Such agreements arise when competing oligopolists reach a verbal agreement on product price, market shares almost invariably being left to the ingenuity of each seller as reflected in nonprice competition. Gentlemen's agreements arise at trade conventions, on the golf course, or at cocktail parties, not in a lawyer's office. Although they too collide with the antitrust laws, their *sub rosa* and intangible character make them more difficult to detect and prosecute successfully.[2]

What will be the economic consequences of a gentlemen's agreement? Assuming the entry of new firms is blocked, the price-output consequences of a gentlemen's agreement are likely to be very much like those of a pure monopoly. Output will be restricted in the interest of maximizing profits for the several firms, and this will mean higher prices and underutilized plants. As a matter of fact, the price-output results of collusive oligopoly may from the consumer's standpoint be inferior to those of pure monopoly for several reasons.

1. Pure monopoly in the United States is almost invariably subject to government regulation to mitigate abuses of such market power. A *sub rosa* gentleman's agreement may create an approximation of pure monopoly, yet it maintains the outward appearance of several independent and "competing" firms.

2. It is possible that the existence of several distinct oligopolistic producers will cause the industry and society to forgo some economies of scale which those firms, combined as a pure monopoly, could realize. For example, a multiplant pure monopolist can ship to customers from that plant which is closest to the buyer. But under a gentlemen's agreement on price, wasteful crosshauling

[2] For a fascinating case study of collusive pricing, read Clarence C. Walton and Frederick W. Cleveland, Jr., *Corporations on Trial: The Electric Cases* (Belmont, Calif.: Wadsworth Publishing Company, Inc., 1964).

may result. The oligopolist located in California ships to a customer in New Jersey, while the New York oligopolist ships to an Oregon buyer.

3. Collusive oligopolists may engage in extensive competitive advertising and sales promotion which is of little benefit to the public. This is particularly so when products are differentiated. Under pure monopoly this would be largely, if not fully, eliminated.

4. Because price agreements are difficult to negotiate, oligopolists may be inclined to maintain the existing agreed-upon price even though cost-reducing technological advances would make it profitable for the firms to lower this price. Fearing the inability to reach precise agreement on a new and lower price and a possible breakdown of the gentlemen's agreement, the firms may simply let well enough alone and accept a less-than-maximum profit. This will mean that consumers are deprived of the lower price and the greater output that lower unit costs now justify. The pure monopolist, unhampered by the problem of price negotiation with rivals, would cut price and increase output to his own benefit and to the benefit of consumers.[3]

Informal, Tacit Collusion

The illegality of gentlemen's agreements has prompted many oligopolistic industries to seek still less formal means of avoiding the uncertainties of independent, noncollusive action. Many important American industries have long followed the practice of *price leadership*, that is, one firm—usually the largest in the industry—initiates price changes, and all other firms more or less automatically follow that price change. In some cases—for example, the oil and cigarette industries—the identity of the price leader may vary over time, whereas in other industries—the steel industry—a single firm may persistently enjoy the position of price leader. The importance of price leadership is evidenced in the fact that such industries as farm machinery, anthracite coal, cement, copper, gasoline, newsprint, tin cans, lead, sulfur, rayon, fertilizer, glass containers, and nonferrous metals are practicing or have in the recent past practiced price leadership. Because price leadership is an informal, tacit agreement involving no written or spoken commitments, it is generally accepted as a legal technique by the courts in interpreting the antitrust laws.

Why do firms follow the leader? There is no simple answer here. On the one hand, the situation clearly obligates smaller firms to do so. Followers are obliged to match a price cut, or they will lose sales to the price leader. They must match price increases or else find themselves in effect in the position of a price cutter and exposed to the unhappy prospect of provoking a price war with the price leader. An intermixture of custom and convenience also helps to explain price leadership. In some industries the practice has achieved the status of a deeply ingrained custom which is accepted by all participants with little or no question. Then, too, small followers may be ill equipped to determine their present and estimate their future cost and demand situations; hence they find it convenient to follow the estimates and the judgment of the price leader on these matters. If the price set by the leader yields a reasonable profit for the followers, the latter are not likely to stray from the price-leadership pattern. The belief is professed by followers in many industries that profits will be greater in the long run under price leadership than could be obtained under alternative pricing arrangements. In other words, price leadership largely avoids the uncertainties of independent pricing and, at the same time, usually results in substantial profits for both leader and followers.

A final question remains: How will the price leader determine price? If the position

[3] It must be acknowledged that arguments 2 and 4 are reversible; that is, the combining of several oligopolists into a pure monopoly may lead to *dis*economies of scale, and it is more certain that cost increases will cause *higher* prices and greater output restriction with pure monopoly than with oligopoly.

of the price leader is well established, chances are good that he will seek out the price he feels will maximize his own profits. If the price leader's position is less secure or he is of a benevolent nature, he may seek a price which is mutually satisfactory to price followers and therefore unlikely to upset the price-leadership arrangement. And, too, the price leader may be subject to restraints similar to those facing the pure monopolist. Price must not be "too high" or new rivals will enter, or adverse public opinion and governmental interference may be induced.

Multiproduct Firms and Cost-plus Prices

Thus far our discussion of price and output determination has proceeded on the assumption that each oligopolistic firm produces a single product. In practice, this is the exception, not the rule. Most oligopolistic manufacturers produce a variety of products. And this is not merely a matter of one major product being supplemented by a number of side-line products. To illustrate: Besides producing about half the nation's passenger cars, General Motors is listed in government reports as one of the four largest companies in some twenty-three different lines of production including diesel engines, trucks, buses, railroad locomotives, bicycles, aircraft engines and propellers, household refrigerators, electric ranges, storage batteries, cast iron heating boilers, and air-conditioning equipment.[4] There are some manufacturers that produce literally hundreds and others thousands of separate products.

Motives for product proliferation. A moment's reflection reveals several good reasons for this proliferation of products by manufacturers.

1. In some cases the same productive process necessarily turns out several different products; some products are *joint products.* Meat-packing concerns necessarily produce a variety of products ranging from fillets and frankfurters to hides, glue, fertilizers, and pharmaceuticals. Gasoline and kerosene both result from the process of cracking petroleum; coke and gas are jointly created in the distillation of coal.

2. Firms seek product diversification to lessen the effects of fluctuations in demand. The local coal dealer sells ice in the summer and the furnace manufacturer produces air conditioners to lessen seasonal variations in demand. Automobile manufacturers would be more significantly affected by cyclical fluctuations in consumer spending were it not for the fact that they produce a variety of makes and models. Specifically, the demand for the low-priced models holds up better during recession than does that for luxury models.

3. The long-run quest for profits also induces product proliferation. A firm which now has a decided advantage over rivals in the production of a given product will likely find that that advantage and the accompanying profits will decline over time as competitors successfully imitate or duplicate the product. It thus behooves each firm to develop new products as a means of sustaining profits. To this it must be added that a firm is more likely to incur adverse public opinion and risk an antitrust suit by expanding its share of the market for a given product than it will by channeling its efforts to the production of other existing products or the development of new products.[5]

4. Product diversification is also a means by which a firm can more fully utilize its plant capacity. At any point in time excess plant capacity is likely to plague oligopolistic producers as a result of the tendency of such firms to restrict output in order to realize economic profits. It is tempting for a firm thus situated to devote its excess capacity to some related product to which its capital facilities are adaptable. A television manu-

[4] Senate Committee on the Judiciary, *Administered Prices: Automobiles* (Nov. 1, 1958), pp. 25–28.

[5] See A. D. H. Kaplan, *Big Enterprise in a Competitive System* (Washington: The Brookings Institution, 1954), pp. 187–188.

facturer, for example, may have excess plant capacity because fuller utilization in television-set production would call for lower prices (and hence the risk of price warring) and lower profits. The firm therefore uses its excess facilities to produce radios, electric clocks, and parts for radar equipment. Incidentally, a firm's research department is in effect a part of its plant capacity. Failure to produce any promising new products which this department develops will obviously mean it is underutilized.

Complexities of multiproduct pricing. For reasons already noted, it may be difficult for a single-product firm to practice marginal-cost-equals-marginal-revenue pricing. The task is virtually impossible for the multiproduct firm. This is partially so for the obvious reason that there are so many more prices to be determined and then redetermined when cost and revenue conditions change. But complex problems also arise because it is difficult for a multiproduct firm to allocate its costs accurately among the many specific products it produces. Some costs are *separable* costs; that is, they can be associated with the production of specific products. For example, labor and materials used exclusively in the production of a specific product are separable costs. These pose no great problem. But other costs—costs which we have previously classified both as fixed and variable—are *common* costs; that is, they are costs which are associated with the firm's many products as a group. Most fixed costs will be common costs: rental payments, salaries of management, some depreciation charges, interest charges, and insurance costs are good illustrations. And some variable costs will be common costs: the materials and labor used in the production of joint products are examples. How is the cost of a steer to be apportioned among the many meat products, the hide, the fertilizer, and the pharmaceuticals which will result from its slaughter? What about the cost of the labor employed in the rendering process? Because there is no precise way to allocate variable common costs among specific products, it is impossible to calculate the marginal costs of these many products.

Multiproduct pricing poses a second problem: Product proliferation contains the seeds of price warring. Unless oligopolistic firms allocate common costs to the various products in some more or less uniform way, they will establish significantly different costs and hence different prices on their products. But under oligopoly, firms producing high-priced products will of necessity be forced to meet the lower prices of competitors. To illustrate: Firm A charges a low price on its refrigerators and a high price on its air conditioners because it has arbitrarily apportioned most of its common costs to its air conditioners. Firm B, however, has arbitrarily allocated most of its common costs to refrigerators and therefore charges a high price for refrigerators and a low price for air conditioners. This means that A will have to cut its air-conditioner price to meet B's and, conversely, B will need to slice its refrigerator prices to meet A's low prices. Price cutting and possibly price warring will result in this situation. To the benefit of consumers and the dismay of producers such aggressive price competition, caused by nonuniform allocations of common costs, may result in losses for both firms.

Cost-plus pricing. To circumvent both these problems oligopolistic multiproduct firms very frequently employ cost-plus pricing. There are two basic steps in this pricing technique.[6] First, the firm simply estimates the separable costs per unit on its various products when it is producing at some average or typical rate of output, for example, two-thirds or three-fourths of capacity. The resulting figure is the "standard cost" of the

[6] There are many variations of and qualifications to the simple technique here explained. The interested reader is referred to Joel Dean, *Managerial Economics* (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1951), pp. 444–457, and Milton H. Spencer and Louis Siegelman, *Managerial Economics* (Homewood, Ill.: Richard D. Irwin, Inc., 1959), p. 292ff.

product. Second, price is determined by adding some "markup," or "margin," to the standard cost figure to allow for common costs and a "fair," or "reasonable," profit. To illustrate: If the standard cost of product X is estimated to be $10 and the markup is 20 per cent, the product's price will be set at $12.

Though cost-plus pricing may be an accurate picture of how many multiproduct businesses set prices, it is not a very satisfactory theory of oligopolistic pricing, because it does not explain why the markup is 10, 15, 25, or 35 per cent. In many instances the markup is "customary"; that is, it is a figure which has been evolved through trial-and-error experimentation by the industry and which seems to yield a satisfactory profit to firms.

The simplicity of this rule-of-thumb pricing technique need hardly be elaborated. Cost-plus pricing is a workable and expedient means of price determination. However, its usefulness as a means of avoiding oligopolistic price warring is not quite so evident. If a group of oligopolists employ essentially the same productive techniques, as is often the case, the application of cost-plus pricing will provide each firm with approximately the same standard cost figure. The application of a common markup figure which is customary to the industry will then result in identical or at least very similar prices. In other words, cost-plus pricing is a means by which multiproduct oligopolists can successfully avoid price competition and price warring. When a group of firms employ standard or similar cost-accounting techniques and apply the same markup figure to the resulting standard cost estimates, they have at their disposal, in the form of cost-plus pricing, a subtle and tacit technique of price collusion.

BASIC ROLE OF NONPRICE COMPETITION

We have noted that, for several reasons, oligopolists have a notable aversion to price competition. This aversion may lead to some more or less informal type of collusion on price. In the United States, however, price collusion is usually accompanied by nonprice competition. It is typically through nonprice competition that each firm's share of the total market is determined. This emphasis upon nonprice competition has its roots in two basic facts.

1. Price cuts can be quickly and easily met by a firm's rivals. Because of this the possibility of significantly increasing one's share of the market through price competition is small; rivals will promptly cancel any potential gain in sales by matching price cuts. And, of course, the risk is always present that price competition will precipitate disastrous price warring. More positively stated, oligopolists seem to feel that more permanent advantages can be gained over rivals through nonprice competition, because product variations, improvements in productive techniques, and successful advertising gimmicks cannot be duplicated so quickly and so completely as can price reductions. And there is less likelihood of nonprice competition's forcing all firms to the wall profitwise in the manner of unbridled price competition. Nonprice competition is less likely to get out of hand. It might be added that many oligopolistic producers of consumer goods apparently are of the opinion that consumers are more product- and advertising-conscious than they are price-conscious.

2. There is a more obvious reason for the tremendous emphasis which oligopolists put upon nonprice competition: Manufacturing oligopolists are typically blessed with substantial financial resources with which to support advertising and product development. Hence, although nonprice competition is a basic characteristic of both monopolistically competitive and oligopolistic industries, the latter are in a financial position to indulge more fully.

We need not restate the pros and cons of advertising. The arguments stated in Chapter 28 with respect to advertising under monopolistic competition are pertinent when

applied to oligopoly. However, the implications of the rather prodigious outlays which manufacturing oligopolies sometimes make for technological research on both product quality and productive techniques are a matter of major concern.

OLIGOPOLY AND ECONOMIC EFFICIENCY

The troublesomeness of evaluating the economic efficiency of oligopoly is matched only by the importance of such an evaluation. The root difficulty is that of deciding whether it is more realistic to look at the probable effects of oligopoly in a short-run (static) or in a long-run (dynamic) environment.

Restrictive Oligopoly

The more or less traditional view holds that, because oligopoly is close to pure monopoly in structure, we should expect it to operate in a similar way. Being characterized by barriers to entry, oligopoly can be expected, according to this view, to result in a restriction of output short of the point of lowest unit costs and a corresponding market price which yields substantial, if not maximum, economic profits. These points usually rest upon an analysis similar to that shown in Figure 29–3*a*. Facing a *given* demand and a *given* cost situation, the oligopolist will find that it pays him to be restrictive. As indicated in Figure 29–3*a*, higher unit costs will soon arise if output is expanded far beyond Q_1, and the lowering of price which such an expansion requires courts the disaster of a price war. Other things being equal, the price and output results under such an oligopoly would be clearly inferior to those of pure competition. Worse yet, for reasons noted earlier, the results of oligopoly might even be inferior to those of a pure monopoly. If pure monopoly impairs the efficient allocation of resources by producing short of the $P = MC$ point, so then does oligopoly.

At the level of macroeconomics we have previously noted that cost-push and structural inflation are based upon the existence of market power. Therefore, oligopoly may also be criticized as a potential source of inflationary pressure.

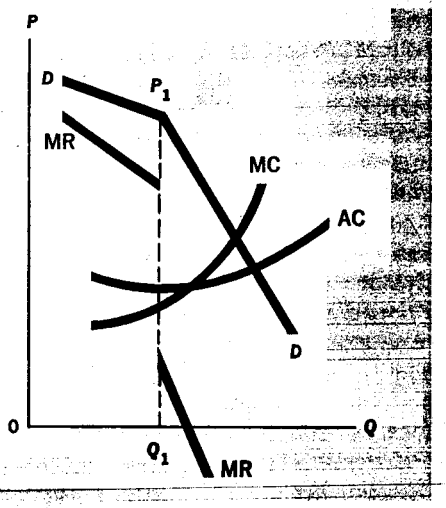
Progressive Oligopoly

The above view of oligopoly seems at odds with the historical facts surrounding the operation of many oligopolistic manufacturing industries such as the automobile, farm-equipment, electronics, home-appliance, and steel industries. These industries have been characterized by falling product prices, improvements in product quality, and expanding levels of output and employment over a period of years. But caution is required here. The basic issue is whether this progress would have been even greater had these industries been organized on a purely competitive basis. And, lacking the ability to conduct controlled laboratory experiments, the economist cannot offer a clear-cut answer. It is evident, however, that there has been significant progress in some oligopolistic industries, and the possibility does exist that in the long run some oligopolistic industries may well have fostered lower unit costs, lower prices, and a greater output than the same industry would have provided if organized competitively. Graphically, the restrictive situation portrayed in Figure 29–3*a* may give way over time to the progressive situation reflected in Figure 29–3*b*, wherein demand and output have been substantially increased and unit cost and price reduced as compared with Figure 29–3*a*.[7]

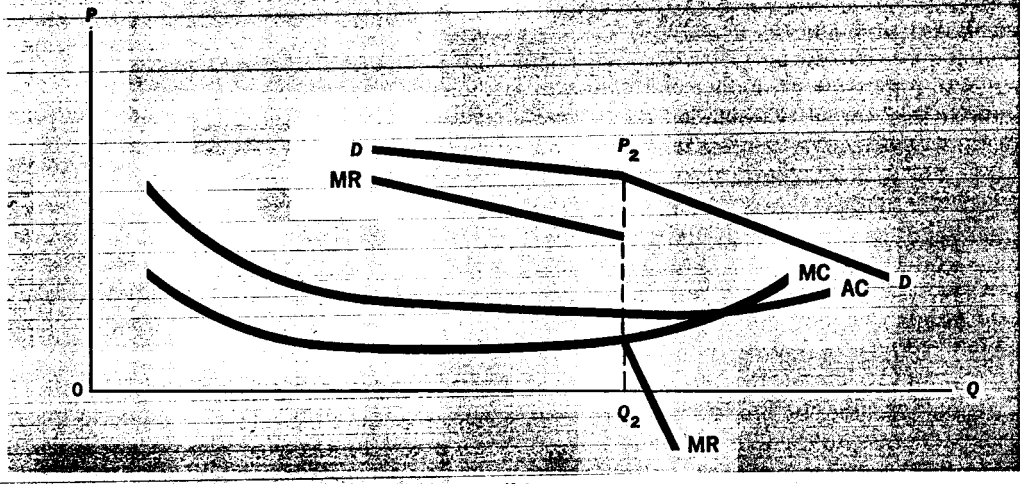
Technological progress: the argument. Generally speaking, the reasons for this possible progressiveness lie in the fact that many oligopolistic industries focus their competi-

[7] This comparison of restrictive and progressive oligopoly and the graphic presentation of Figure 29–3 are based upon Henry Grayson, *Price Theory in a Changing Economy* (New York: The Macmillan Company, 1965).

FIGURE 29–3. RESTRICTIVE AND PROGRESSIVE OLIGOPOLY.
Restrictive oligopoly (a): Faced with given demand and marginal revenue data (such as DP_1D and MRMR) and given cost data (such as AC and MC), the oligopolist will maximize profits by restricting output to Q_1 and charging price Q_1P_1. In expanding output beyond Q_1, the oligopolist must accept considerable price reductions and run the risk of starting a price war. Furthermore, by expanding the output, the producer may soon encounter rising average costs AC.
Progressive oligopoly (b): In fact some oligopolists have been progressive, achieving lower average costs AC and marginal costs MC through technological advance. Similarly, demand DP_2D and marginal revenue MRMR have been pushed far to the right as a result of product development and want-creating activities. As compared to the restrictive oligopoly of (a), the net result of progressive oligopoly has frequently been a larger output (Q_2 as compared to Q_1) and a lower price (Q_2P_2 as compared to Q_1P_1).



(a)



(b)

tive energies upon technological competition as reflected in both the development of productive techniques and improvement of product quality. The betterment of productive techniques will have the effect of expanding the range of constant or, better yet, declining unit costs. Advances in product quality, accompanied by advertising and related want-creating activities, will shift the firm's demand curve to the right. As indicated in Figure 29–3*b*, product price is very likely to decline with declines in unit costs.

At present there is a rather widely held presumption that modern oligopolies have both greater means and a stronger inclination for technological advance than does any other market structure. Let us summarize the arguments underlying this presumption and then test them against such statistical data as are available.

First, oligopolies typically possess the *means*–substantial profits–with which to undertake the incredibly expensive task of modern research. Technological progress, it is contended, is no longer in the domain of the back-yard Edison or the basement Whitney. Rather, it is the result of highly organized and cooperative efforts of a variety of scientists and engineers housed in the elaborate research departments of such giant oligopolies as du Pont and General Electric. Purely and monopolistically competitive firms, being smaller and less prosperous, are decidedly less progressive.

Second, oligopolistic producers have a host of good *incentives* for accelerating technological advance:

1. Given their disposition to avoid price competition, technological, or cost, competition provides an obvious alternative means for enlarging total profits through an expanded product demand and lower unit costs. Like advertising and product development, the discovery of more efficient productive techniques is less certainly and less quickly matched by one's rivals than is a price cut.

2. Technological superiority is a basic means by which an oligopolist can ensure survival in the event that a price war should somehow plague the quiet life of the industry.

3. In contrast to an unrivaled, pure monopolist, the presence of several strong rivals puts the oligopolist under considerable pressure to seek maximum productive efficiency. Failure to do so may mean that his several competitors will in time drive him out of business. The pure monopolist, being devoid of rivals, is under no competitive spur to technical progress. But the oligopolist, having a few rivals, clearly is in an environment of technological competition.

4. The existence of barriers to entry gives the progressive oligopolist some assurance that he will actually realize the profit rewards to which his research expenditures may give rise. This is in contrast to a monopolistically competitive market, wherein the rewards of a new productive technique will be shared by many competitors who will quickly copy or imitate a progressive firm without bearing any of the research and development costs. And the presence of a large number of rivals will hasten price reductions to consumers, based upon the cost reductions stemming from the advance. The presence of fewer rivals and the proclivity of oligopolists not to cut price enhance the possibility of the innovating oligopolist's realizing greater profit rewards from his technical progress. The importance of this point is evident in an economy such as American capitalism, wherein the basic drive wheel is profits.

Technological progress: the evidence.[8] Such data as are available do considerable damage to the image of the oligopolistic industry as a mainspring of research and development

[8] This section draws heavily upon Daniel Hamberg, "Size of Firm, Monopoly, and Economic Growth," in *Employment, Growth, and Price Levels, Hearings of the Joint Economic Committee, Part 7* (Washington, 1959), pp. 2337–2352, and "Invention in the Industrial Research Laboratory," *Journal of Political Economy*, April, 1963, pp. 95–115.

activity. Available statistics suggest that the research laboratories of giant corporate oligopolies are *not* the fountainhead of technological advance. A recent study[9] of sixty-one important inventions made since 1900 indicates that over half were the work of independent inventors, quite disassociated from the industrial research laboratories of corporate enterprise. Such substantial advances as air conditioning, power steering, cellophane, the jet engine, insulin, the helicopter, and the catalytic cracking of petroleum have this individualistic heritage. Other equally important advances have been provided by small- and medium-sized firms. According to this study, about two-thirds—40 out of 61—of the basic inventions of this century have been fathered by independent inventors or the research activities of relatively small firms. Other studies—for example, analyses of patent statistics—reinforce the conclusion that a large proportion of basic technological advances originates outside the laboratories of giant oligopolies.

This, of course, is the overall picture and does not in any way repudiate the fact that in a number of oligopolistic industries—for example, the aircraft, chemical, petroleum, and electrical-equipment industries—research activity has been pursued vigorously, fruitfully, and on an expanding scale. But even here we must amend at least two important qualifications. In the first place, there are a number of other oligopolistic industries wherein it is generally agreed that the interest in research and development activity has been modest at best; the steel, cigarette, and aluminum industries are cases in point. Secondly, a very substantial portion of the research carried on by oligopolistic industries is actually financed with public funds. For example, about 90 per cent of the research performed in the aircraft-missile industry is government sponsored, over 60 per cent in the electrical-equipment industry, 71 per cent in the communications industry, and so forth. Despite the increased interest of businesses, the Federal government remains the most important source of funds for research and development activity.

[9] John Jewkes, David Sawers, and Richard Stillerman, *The Sources of Invention* (New York: St Martin's Press, Inc., 1958).

Countervailing Power

There is a second consideration which brightens somewhat the traditional dim view of oligopoly. John K. Galbraith of Harvard has developed the notion that many oligopolies (and monopolies) tend to induce the development of oligopolies (and monopolies) on the opposite side of the market.[10] That is, the existence of a monopolistic (or oligopolistic) seller tends to stimulate the growth of a monopsonistic (or oligopsonistic) buyer, and vice versa. More specifically, there is a tendency for "countervailing power" to evolve on the opposite side of those markets in which strong positions of "original power" have already developed. The development of countervailing power is not a matter of chance. It stems, on the one hand, from the desire of resource suppliers or customers to protect themselves from any abuses of the original-power position and, on the other hand, from the desire to share in the profits of the original-power position. Stated differently, for both defensive and offensive reasons, countervailing power is self-generating. Oligopoly begets oligopoly on the opposite side of the market. Oligopoly, in effect, generates its own antidote.

The significance of countervailing power is implicit in the concept itself. Countervailing power, or "across-the-market" competition, can be an important competitive force in those very markets in which "same-side-of-the-market" rivalry is weak. Oligopolistic sellers may be restrained by a few large buyers. The Big Four of the tire industry face the Big Three of the automobile industry; chain grocery stores and

[10] John Kenneth Galbraith, *American Capitalism*, rev. ed. (Boston: Houghton Mifflin Company, 1956), particularly chap. 9.

mail order houses buy in quantity from oligopolistic food processors and manufacturers. Oligopsonistic buyers may be faced with a small number of sellers. Labor unions face gigantic employers; agricultural marketing cooperatives sell to large food processors. Now, to the degree that these opposed positions of market power are successful in checking or restraining the power of one another, the successful operation of a market system characterized by oligopoly will be furthered. Buyer and seller may cancel the power and negate the potential market abuses of one another. The monopolistic seller who seeks a high monopolistic price is faced with a monopsonistic buyer who obviously is interested in a low monopsonistic price. That is, each seeks to use his market power to raise or depress price to his own advantage. The market power of each may be largely self-canceling, and the resulting compromise price close to the competitive level. Furthermore, given the compromise price, the monopolist will have no incentive to restrict his output and sales as he would be obligated to do in establishing a monopolistic price. Thus the net result of monopoly on both sides of the market may be a price and output closer to those of pure competition than if monopoly existed on only one side of the market. This is true of oligopoly as well. Countervailing power is an important regulatory force in American capitalism and makes the economy more competitive than any discussion limited to same-side-of-the-market competition would lead one to conclude.

Countervailing power, however, is not devoid of shortcomings and criticisms. One shortcoming is that it is not universally present. In the automobile industry, for example, dealers are highly dependent upon manufacturers and thus in a poor position to bargain for lower automobile prices which may benefit both themselves and consumers. In other cases—for example, the petroleum industry—manufacturers are integrated vertically down to the consumer, thus excluding the possibility of countervailing power. Because the residential-construction industry is composed of thousands of small and unorganized contractors, no countervailing power is exerted against oligopolistic suppliers of building materials.

Even where countervailing power is firmly established, it does not function with equal effectiveness under all economic conditions. In particular, during periods of inflation countervailing power does not operate effectively as a competitive force, because with excess demand buyers are no longer able to restrain sellers. When a resource buyer enjoys a seller's market for his product, he is not apt to offer stiff resistance to the demands of resource suppliers. This is best exemplified in the labor market, where unions as "sellers" of labor are in a most strategic position in bargaining with employers during inflation. Management does not want to risk a work stoppage when consumer demand is burgeoning. Why resist? Increases in wage costs (and more) can be readily passed on to the consumer through price increases with no loss of sales, and profits thereby can be maintained or even expanded. The results of this situation are anything but socially desirable.

Finally, it has been pointed out that the two power positions may both benefit at the expense of the rest of the economy by combining their forces rather than by offsetting one another. Across-the-market rivals may find mutual advantages in collusive action or outright merger rather than in expending their energies in negating the market power of one another.

Oligopoly: Tentative Appraisal

Having surveyed these two viewpoints, what, if anything, can we conclude about the economic efficiency of oligopolistic industries? Not much more than this: Assuming *given* long-run costs of production, an oligopolistic industry will produce less, provide fewer jobs, and charge a higher product price than would the same industry organized competitively. But to the extent

that oligopoly results in lower unit costs and improvements in product quality, this conclusion must be altered in a manner less condemnatory of oligopoly. That is, *if* large oligopolistic producers are in a better position than competitive firms to realize existing (known) economies of scale or are more able and willing to develop improved productive techniques and better products, then oligopoly *may* be more desirable socially than competition. However, despite plausible arguments why oligopoly may be progressive, such empirical evidence as is available suggests that giant oligopolistic corporations are not the basic source of technological advance in our society. Furthermore, there are many known instances (see footnote 2) in which oligopolists, unbridled by countervailing power, have sorely abused their market power to the detriment of society as a whole. Indeed, the picture is a mixed one: when oligopolies are good, they may be very good; when they are bad, they tend to be very bad. The examination of specific cases will reveal both restrictive and progressive oligopolies. This tentative conclusion is worth venturing: Oligopolistic industries may be much more palatable over time, that is, in the long run, than they seem to be at a particular point in time.

SUMMARY

1. Oligopolistic industries are characterized by few firms, each of which has a significant fraction of the market. Firms thus situated are mutually interdependent; the behavior of any one firm directly affects and is affected by the actions of rivals. Products may be virtually uniform or significantly differentiated; entry is substantially restricted, frequently by technological considerations.

2. The wide variety of oligopolistic markets and the uncertainty which stems from mutual interdependence limit the applicability of formal economic analysis to oligopolistic markets. The factual record indicates, however, that **a.** oligopolistic prices tend to be inflexible, or "sticky," and **b.** the price changes which do occur are "orderly" in the sense that firms tend to change their prices together.

3. Independent (noncollusive) oligopolists in effect face a kinked demand curve. This curve and the accompanying marginal-revenue curve help explain the price rigidity which characterize such markets; they do not, however, explain the level of price.

4. The uncertainties inherent in independent pricing are conducive to collusion. Gentlemen's agreements on price may entail economic consequences even less desirable to society than pure monopoly because **a.** the oligopolists are likely to escape public regulation, **b.** economies of scale may be sacrificed, **c.** wasteful competitive advertising may persist, and **d.** the resulting price rigidity may forestall price reductions which cost-reducing technological advances justify.

5. Price leadership, whereby all firms in the industry follow the price changes of a dominant firm, is a less formal and widely practiced form of price collusion.

6. Many oligopolistic producers are multiproduct firms. There are many reasons behind product proliferation: **a.** Some products are jointly produced, **b.** product diversification provides insurance against demand fluctuations, **c.** the initial advantage of being the sole producer of a newly developed product is conducive to high profits, and **d.** a firm can more fully utilize its plant through product diversification.

7. In multiproduct firms some costs are separable, that is, associated exclusively with the production of specific goods, whereas others are common, associated with many products taken as a group. This poses two difficulties: **a.** It is extremely difficult to calculate marginal costs for each product, and **b.** significant price differences and price warring may result from the lack of a uniform technique in allocating common costs to different products.

8. Cost-plus pricing is used to side-step these difficulties. By this rule-of-thumb pricing technique, per unit separable costs are calculated, or estimated, for a typical rate

of output; a customary markup which includes common costs and a fair profit is then added to this standard-cost figure in determining price.

9. Market shares in oligopolistic industries are usually determined on the basis of nonprice competition. Oligopolists emphasize nonprice competition because **a.** advertising and product variations are less easy for rivals to match and **b.** oligopolists frequently have ample financial resources to finance nonprice competition.

10. There is no clear-cut conclusion as to the social desirability of oligopoly; oligopoly may be either restrictive or progressive. Where oligopoly is restrictive, abuses of its market power may sometimes be curbed by countervailing power.